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- (a) a polynucleotide encoding a TbpA polypeptide of *P. haemolytica* comprising an amino acid sequence as set forth in SEQ ID NO:2;
- (b) a polynucleotide encoding a TbpA polypeptide of *P. haemolytica* comprising amino acid 1 to amino acid 930 as set forth in SEQ ID NO:2;
- (c) a polynucleotide encoding a TbpA polypeptide of *P. haemolytica* comprising amino acid 29 to amino acid 930 as set forth in SEQ ID NO:2; and
- (d) a polynucleotide which is complementary to the polynucleotide of (a), (b) or (c),
wherein said stringent conditions include a post hybridization wash of 2X SSC (sodium chloride/sodium citrate) at 50°C.

43. (Twice Amended) An isolated and purified nucleic acid molecule comprising the polynucleotide of claim 30, wherein said nucleic acid molecule is produced by a process comprising the steps of:

- (a) screening a genomic DNA library using as a probe a target sequence defined by the SEQ ID NO: 1, or fragments thereof;
- (b) identifying members of said library which contain sequences that hybridize to said target sequence; and
- (c) isolating an intact coding sequence from one or more of said members identified in step (b).

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154. (Twice Amended) An isolated and purified DNA molecule comprising the polynucleotide of claim 30, wherein said polynucleotide is produced by a process comprising the steps of:

- (a) isolating mRNA, DNA, or cDNA produced from a *P. haemolytica* organism;
- (b) amplifying nucleic acid molecules whose nucleotide sequence is homologous to amplification primers derived from said fragment of said *P. haemolytica* genome to prime said amplification;
- (c) isolating said amplified sequences produced in step (b).